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<u>Set</u>	<u>Hit</u>	<u>Set</u>
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<u>L15</u> (first or main or primary) near (network or internet or www) near connection	918	<u>L15</u>
<u>L14</u> first near (network or internet or www) near connection	772	<u>L14</u>
<u>L13</u> 709/253	653	<u>L13</u>

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<u>L17</u>		L16 and (backup or back with up or back adj up or archive) and restore	16	<u>L17</u>
<u>L16</u>		L15 and (second or secondary)	879	<u>L16</u>
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<u>L5</u>	l1 and backup and restore	1394	<u>L5</u>

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L8: Entry 286 of 288

File: USPT

Apr 8, 1997

DOCUMENT-IDENTIFIER: US 5619684 A

TITLE: Method and apparatus for consistent user interface in a multiple application personal communications device

Abstract Text (1):

An option attach connector has a first indicator bit combination that alerts the device that a public switched telephone network connection has been made to it. The presence of the first indicator bit combination is a signal to the device that telephone, FAX, and E-mail communications applications are to be conducted over a PSTN link. The presence of the first indicator bit combination invokes the stored computer program to display images of menus, keypads, and visual presentations on the LCD display that are consistent with a basic display layout for both cellular telephone network and PSTN modes, but that include customized presentation features that are unique to the PSTN mode of communications. The presence of a second indicator bit combination different from the first indicator bit combination invokes the stored computer program to display corresponding images of menus, keypads, and visual presentations on the LCD display that are consistent with the basic display layout for both cellular telephone network and PSTN modes, but that include customized presentation features that are unique to the cellular telephone network mode of communications.

Brief Summary Text (10):

It is widely recognized that digital communications technology and data processing technology are converging. One example of this is the development of portable personal computers that include telephone modems, enabling the transmission of digital information over public switched telephone networks (PSTN). Another example is the development of mobile radio telephones that use microprocessors executing stored programs for sampling and digitizing the voice signal, multiplexing the transmission of the digitized voice signal with other such voice signals, and digitally controlling the operations of the cellular telephone device.

Brief Summary Text (11):

The most recent evidence of the convergence of digital communications technology with digital personal computer technology, is the SIMON personal communications device described in the above identified patent applications. The SIMON personal communications device has many features within it to enable personal communications. The personal communications device provides a cellular telephone, a facsimile transmission and receiving capability, an electronic mail sending and receiving capability, and an electronic pager, a computer notepad, a computer address book, a computer calendar, and a computer calculator, all within a single compact portable package.

Brief Summary Text (12):

The SIMON personal communications device includes a central processing unit (CPU) that executes stored programmed instructions stored in electrically programmable read only memories (EPROM). The stored program instruction in the EPROM's include basic input output operating system (BIOS) programs, and application programs to perform the functions of cellular telephony, public switched telephone network (PSTN) telephony, facsimile transmission and reception, electronic mail, pager functions, computer notepad functions, computer address book functions, computer

calendar functions, and computer calculator functions. These stored programs are selectively accessed for execution by the CPU.

Brief Summary Text (15):

The LCD screen presents menu images to the user to enable the selection of communications applications such as telephone, facsimile (FAX), or electronic mail (E-mail). For each of these applications, a corresponding keypad and presentation area is displayed. The user has the option of employing either a public switched telephone network link or a cellular telephone network link for any of these communications applications. However, the functions required to be performed in order to send or receive a cellular telephone network call are different from the functions required for a call over a public switched telephone network.

Brief Summary Text (16):

All cellular telephones use two-way radio communications controlled by the cellular telephone network. The ambient atmospheric and geographic conditions can affect the strength of the transmitted signal. When transmitting a large amount of data during a FAX or an E-mail session, an acceptable signal strength is required to ensure that data is not lost and to keep the transmission error-free. A signal strength indicator is required on cellular telephones to enable the user to monitor the signal strength and change its location to improve it. Further, a cellular telephone must be registered with the home region it usually employs as the base for its communications. If the cellular telephone is transported outside of its home region, it becomes a roamer, and a different mode of operation called roaming, is carried out. A cellular telephone must provide an indication to the user as to its current mode of operation, either home or roaming. Such concerns are absent from calls using a public switched telephone network.

Brief Summary Text (17):

Users prefer consistency in the appearance and use of menus, keys and displays needed to operate a multiple application device such as the SIMON personal communications device. What is needed is a means to provide a consistent user interface for a multiple application personal communications device, that also provides the customized interface features necessary to enable the user to interact with the selected communications medium, either a public switched telephone network or a cellular telephone network.

Brief Summary Text (21):

It is a further object of the invention to provide adaptive user interface for a multiple application personal communications device for communication over both public switched telephone networks and cellular telephone networks.

Brief Summary Text (24):

The invention is used in a personal communications device that includes a memory that stores the operating system programs and the applications programs for execution by a central processing unit (CPU) in the device. The programs selectively manage the operations of a cellular telephone, a facsimile receiver, a touch overlay input and display, and several desktop functions such as a calendar, notepad, and electronic mail.

Brief Summary Text (26):

In accordance with the invention, the option attach connector has a first indicator bit combination that alerts the device that a public switched telephone network connection has been made to it. The presence of the first indicator bit combination is a signal to the device that telephone, FAX, and E-mail communications applications are to be conducted over a PSTN link.

Brief Summary Text (27):

In accordance with the invention, the presence of the first indicator bit combination invokes the stored computer program to display images of menus,

keypads, and visual presentations on the LCD display that are consistent with a basic display layout for both cellular telephone network and PSTN modes, but that include customized presentation features that are unique to the PSTN mode of communications.

Brief Summary Text (28):

Further in accordance with the invention, the presence of a second indicator bit combination different from the first indicator bit combination invokes the stored computer program to display corresponding images of menus, keypads, and visual presentations on the LCD display that are consistent with the basic display layout for both cellular telephone network and PSTN modes, but that include customized presentation features that are unique to the cellular telephone network mode of communications.

Brief Summary Text (29):

The presence of the predetermined indicator bit combinations also invokes the stored computer program to provide appropriate connections between the PSTN link or the cellular telephone network and the telephone, FAX, and modem hardware in the device.

Drawing Description Text (4):

FIG. 1B is an overall functional block diagram of the personal communications device, in a cellular telephone network mode, for voice communications over a cellular telephone network, in accordance with the invention.

Drawing Description Text (6):

FIG. 1D is an overall functional block diagram of the personal communications device, in a cellular telephone network mode, for FAX communications over a cellular telephone network, in accordance with the invention.

Drawing Description Text (7):

FIG. 1E is an overall functional block diagram of the personal communications device, connected to an external microphone and speaker cable option attach connector for voice communications over a cellular telephone network, in accordance with the invention.

Drawing Description Text (12):

FIG. 5B is an illustration of the appearance of the image 50B displayed on the display/touch overlay 112, for voice communications over a cellular telephone network.

Drawing Description Text (14):

FIG. 5D is an illustration of the appearance of the image 50D displayed on the display/touch overlay 112, for FAX communications over a cellular telephone network.

Drawing Description Text (15):

FIG. 5E is an illustration of the appearance of the image 50E displayed on the display/touch overlay 112, for E-MAIL communications over a PSTN.

Drawing Description Text (16):

FIG. 5F is an illustration of the appearance of the image 50F displayed on the display/touch overlay 112, for E-MAIL communications over a cellular telephone network.

Drawing Description Text (19):

FIG. 6B illustrates the layout of the cellular customizing image 50Z produced by the cellular screen file 184, that when combined with the master image 50X of FIG. 6 by the interface program 180, produces the image 50B of FIG. 1B and FIG. 5B, as it is displayed on the display/touch overlay 112, for voice communications over a

cellular telephone network.

Detailed Description Text (5):

The RAM 102 also stores the cellular screen file 184, that contains the layout of the cellular customizing image 50Z, that when combined with the master image 50X of FIG. 6 by the interface program 180, produces the image 50B of FIG. 1B and FIG. 5B, as it is displayed on the display/touch overlay 112, for voice communications over the cellular telephone network in FIG. 1B. The audio MUX in FIG. 1B selectively configures the connection 60B connecting the ear piece and microphone 117 to the cellular telephone interface 114.

Detailed Description Text (6):

The RAM 102 also stores the PSTN FAX screen file 182' that is used by the interface program 180 to produce the image 50C in FIG. 5C, which is an illustration of the appearance of the image 50C displayed on the display/touch overlay 112, for FAX communications over a PSTN in FIG. 1C. The audio MUX in FIG. 1C selectively configures the connection 60C connecting the FAX 172/modem 170 to the PSTN cable 200. FIG. 5E is an illustration of the appearance of the image 50E displayed on the display/touch overlay 112, for E-MAIL communications over a PSTN. Its generation by the interface program 180 and the connections by the audio MUX 160 are the same as that for FIG. 1C.

Detailed Description Text (8):

The RAM 102 also stores the cellular FAX screen file 184' that is used by the interface program 180 to produce the image 50D in FIG. 5D, which is an illustration of the appearance of the image 50D displayed on the display/touch overlay 112, for FAX communications over a cellular telephone network in FIG. 1D. The audio MUX in FIG. 1D selectively configures the connection 60D connecting the FAX 172/modem 170 to the cellular telephone interface 114. FIG. 5F is an illustration of the appearance of the image 50F displayed on the display/touch overlay 112, for E-MAIL communications over a cellular telephone network. Its generation by the interface program 180 and the connections by the audio MUX 160 are the same as that for FIG. 1D.

Detailed Description Text (9):

Also connected to the bus 104 in FIG. 1A, is the BIOS EPROM 108 which stores the basic input output operating system (BIOS) program 134 in 128 kbyte electrically programmable read only memory. Also connected to the bus 104 is the application EPROM 110 which stores application programs. Application programs stored in the application EPROM 110 can include the cellular telephone program 140, the public switched telephone network (PSTN) program 141, the facsimile program 142, the electronic mail (E-MAIL) program 143, the pager program 144, the notepad program 145, the address book program 146, the calendar program 147, the calculator program 148, and other applications and I/O driver programs 149. Also included in the application EPROM 110 is the operating system program 150. Also included in the application EPROM 110 is the PCMCIA card and socket services program 152. The programs stored in the BIOS 108 and the application EPROM 110, can be accessed for execution by the CPU 106.

Detailed Description Text (11):

In accordance with the invention, the option attach connector 126(0) has a first indicator bit combination "000" that alerts the device 100 that a public switched telephone network connection 200 has been made to it. The presence of the first indicator bit combination "000" is a signal to the device 100 that telephone, FAX, and E-mail communications applications are to be conducted over the PSTN cable 200. The presence of the first indicator bit combination "000" invokes interface stored computer program 180 to provide appropriate connections in the audio MUX 160, between the PSTN link 200 and the telephone, FAX, and modem hardware in the device. This is described in the flow diagram of FIGS. 4A to 4D. FIG. 1A shows the audio MUX controlled by the CPU 106 to connect line 174 to line 175 by means of

connection 60A, connecting the ear piece and microphone 117 to the PSTN cable 200.

Detailed Description Text (12):

Further in accordance with the invention, the presence of the first indicator bit combination "000" in FIG. 1A also invokes the stored interface computer program 180 to display images 50A of menus, keypads, and visual presentations on the LCD display 112 that are consistent with a basic display layout for master image 50X of FIG. 6 for both cellular telephone network and PSTN modes, but that include customized presentation features of the PSTN customizing image 50Y of FIG. 6A, that are unique to the PSTN mode of communications. FIG. 6 illustrates the layout of the master image 50X produced by the interface program 180. FIG. 6A illustrates the layout of the PSTN customizing image 50Y produced by the PSTN screen file 182, that when combined with the master image 50X of FIG. 6 by the interface program 180, produces the image 50A of FIG. 1A and FIG. 5A, as it is displayed on the display/touch overlay 112, for voice communications over the PSTN cable 200.

Detailed Description Text (13):

FIG. 1B is an overall functional block diagram of the personal communications device 100, in a cellular telephone network mode, for voice communications over a cellular telephone network, in accordance with the invention. There is no option attach connector in FIG. 1B, and the state of the decoder 122 is the default state with a binary value of "111" for the option value stored in the register 136. In response to this option value, the interface program 180 executes in the CPU 106. The CPU 106 sends control signals to the audio MUX 160 to make the connection 60B between the ear piece and microphone 117 on line 175 and the cellular telephone interface 114 on line 177. This is described in the flow diagram of FIGS. 4A to 4D.

Detailed Description Text (14):

Also connected to the bus 104 is PCMCIA receptacle slot 118 which is adapted to receive the personal computer memory card 120. The personal computer memory card is a PCMCIA standard card as specified in the publication "PC Card Standard", release 2.0, published by Personal Computer Memory Card International Association, September 1991. The PCMCIA card and socket services program 152 manages the interface between the CPU 106 and the personal computer memory card 120. The PCMCIA card and socket services program 152 is described in greater detail in the publication "Socket Services Interface Specification", release 1.0, published by the Personal Computer International Association, September 1991. The personal computer memory card 120, can include extra RAM storage to perform functions such as backup and restore, and to save facsimile images received by the system 100. The personal computer memory card 120 can also include a read only memory (ROM) which has stored in it other pre-stored information such as a metropolitan phone directory. The personal computer memory card 120 can be configured as a reprogramming card for the personal communications device 100. The reprogramming card can contain pre-stored new programs that are to be loaded into the EPROM's 108 and/or 110.

Detailed Description Text (26):

Finally, if all three resistors 220(0), 220(1), and 220(2) are placed at the ID0, ID1 and ID2 positions, as shown in FIG. 2A, this corresponds to the connector 126 (0), which indicates that a RJ11 cable is attached at 200, for public switched telephone network operations. The cable 200 is attached to the connector 126(0). This is applied in FIGS. 1A and 1C.

Detailed Description Text (27):

FIG. 3 is an illustration of the appearance of the menu image 50M displayed on the display/touch overlay 112. The menu image 50M presents the user with communication application options such as voice communications, FAX communications, or E-MAIL communications. The user selects one of the communications applications by touching the touch overlay membrane overlying the displayed application option. The selected

application identity is then stored in the work space 138 of the RAM 102, to be used by the interface program 180, as described in the flow diagram of FIGS. 4A to 4D.

Detailed Description Text (51):

Step 460: Select E-MAIL receive function from menu on display/touch overlay screen 112 (FIG. 3).

Detailed Description Text (54):

Step 466: Access PSTN screen image file and display PSTN E-MAIL screen image 50E on display 112 (FIG. 5E).

Detailed Description Text (56):

Step 470: Access cellular E-MAIL screen image file & display cellular E-MAIL screen image 50F on display 112 (FIG. 5F).

CLAIMS:

1. A system for providing a consistent user interface in a self-contained multiple application personal communications device, comprising:

a mobile radio telephone in the device;

a data storage in the device, for storing program instructions;

a bus means in the device, coupled to said data storage;

a data processor in the device, coupled to said data storage over said bus means, for executing said stored program instructions;

a data display screen in the device, coupled to said data processor, for displaying information;

a program means stored in the data storage, having a first portion for managing communications using a public switched telephone network and displaying a first interface image corresponding to public switched telephone communication on the display screen;

said program means having a second portion, for managing communications using said mobile radio telephone to connect to a network and for displaying a second interface image corresponding to mobile radio telephone communications on the display screen;

a decoding means coupled to the data processor and to the data storage, for selectively causing either said first portion or said second portion of said program means to be executed by the data processor;

an option connector receptacle coupled to said decoding means;

a first option attach connector having a terminal coupled to said public switched telephone network, for selective connection to said option connector receptacle;

a first connector identification means included with said first option attach connector, for identifying said first option attach connector to said decoding means when said first connector is connected to said receptacle, and in response thereto, said decoding means causing the execution of said first portion of said program means and the display of said first image;

said decoding means causing said second portion of said program means to be executed and the display of said second image when said first connector is not

identified to said decoding means.

2. The system for providing a consistent user interface in a multiple application personal communications device of claim 1, which further comprises:

said first portion of said program means displaying a FAX application image for communication with a public switched telephone network as said first interface image on the display screen, in response to said first connector identification means included with said first option attach connector, identifying said first option attach connector to said decoding means when said first connector is connected to said receptacle.

4. The system for providing a consistent user interface in a multiple application personal communications device of claim 3, which further comprises:

said first portion of said program means displaying an E-MAIL application image for communication with a public switched telephone network as said first interface image on the display screen, in response to said first connector identification means included with said first option attach connector, identifying said first option attach connector to said decoding means when said first connector is connected to said receptacle.

5. A method for providing a consistent user interface in a self-contained multiple application personal communications device for both cellular and PSTN communications, comprising:

identifying that a first option attach connector is connected to a receptacle of the device, and in response thereto, causing an execution of a first portion of a program means corresponding to PSTN communications stored in the device;

displaying a corresponding first E-MAIL interface image on a display screen with said first portion of said program means;

identifying an absence of the first option attach connector and in response thereto, causing a second portion of the program means corresponding to cellular communications to be executed;

displaying a corresponding second E-MAIL interface image on the display screen with said second portion of said program means.

6. A system for providing a consistent user interface in a self-contained multiple application personal communications device supporting mobile radio telephone and public switched telephone network communications that includes a data storage and a data processor, comprising:

a data display screen in the device, coupled to said data processor, for displaying information;

an input means, coupled to said data processor, for receiving communications application selection data;

a program means stored in the data storage, having a first portion for managing communications using a public switched telephone network and displaying a corresponding first interface image on the display screen;

said program means having a second portion, for managing communications using a mobile radio telephone network and displaying a corresponding second interface image on the display screen;

a decoding means coupled to the data processor and to the data storage, for

selectively causing either said first portion or said second portion of said program means to be executed by the data processor;

a first option attach connector having a terminal coupled to said public switched telephone network, for selective coupling to said decoding means;

a first connector identification means included with said first option attach connector, for identifying said first option attach connector to said decoding means when said first connector is coupled to said decoding means, and in response thereto, said decoding means causing the execution of said first portion of said program means;

said data processor sending first control signals to said display means to display said first image corresponding to public switched telephone network communication in response to said identification of said first option attach connector and in response to said communications application selection data;

said decoding means causing said second portion of said program means corresponding to mobile radio telephone communications to be executed when said first connector is not coupled to said decoding means;

said data processor sending second control signals to said display means to display said second image in response to said first option attach connector not being coupled to said decoding means and in response to said communications application selection data.

9. The system of claim 6, wherein said communications application selection data is an E-MAIL communications selection.

10. A method for providing a consistent user interface in a multiple application personal communications device that supports cellular and PSTN communications alternatively and includes a data storage and a data processor, comprising:

identifying a first option attach connector coupled to the device indicating PSTN communications and in response thereto, causing the execution of a first portion of a program means;

sending first control signals to a display means to display a first image characterizing PSTN communications in response to said identification of the first option attach connector and in response to communications application selection data;

causing a second portion of said program means to be executed when said first connector is not coupled to the device indicating cellular telephone communications;

sending second control signals to said display means to display a second image characterizing cellular telephone communications in response to said first option attach connector not being coupled to the device means and in response to said communications application selection data.

13. The method of claim 10, wherein said communications application selection data is an E-MAIL communications selection.

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TITLE: Commercial online backup service that provides transparent extended storage to remote customers over telecommunications linksBrief Summary Text (6):

Even though most computing can be done locally on a personal computer, there is often a need to share information between computers. For example, one computer user may wish to send an electronic mail message ("Email") to another computer user. Similarly, a computer user may want to retrieve a file he (or someone else) previously stored on another computer.

Brief Summary Text (9):

An entire industry of "information providers" (also referred to as "on-line services") has been created to support the need for computers to share information. These information providers automatically answer telephone calls placed by user's computers, automatically respond to information requests, and provide the information over the telephone line to the calling computer. Compuserve, Prodigy and America On-line are all examples of information providers. A computer user can use these on-line services to do useful things such as place a computer want ad, read electronic mail messages, download a new video game program, scan the news wires, get a stock quote, and conference with other computer users about his favorite hobby. The information providers require the user to pay a fee each month. This fee can be a flat, unlimited use fee, or it can be based on the amount of connection time. The user's credit card number is often on record, and his credit card is automatically charged every month.

Brief Summary Text (13):

Another way computer users commonly share information is by logging onto the "Internet," a worldwide network of computers connected together. Nearly every university and many other organizations in the United States have connected their computer systems to the Internet. The Internet is commonly used to transfer electronic mail and files between computers. However, some "server" computers on the Internet also provide automatic computing capabilities to remote users. For example, it is possible to send an electronic mail "request" that a particular "server" computer automatically responds to by sending a electronic mail "reply" containing the requested information. A simple example is for a server to reply to a request by sending a text message or file. On a more complex scale, so-called "Archie" servers can automatically perform a database search based on the request, and send back a list of records that meet the search criteria. It is also possible to send programs from a less powerful computer to a more powerful computer, having the more powerful computer execute the program to generate an output file, and then return the output file to the less powerful computer for review and analysis. A wealth of publications and articles are available that provide much more information about the "Internet" and the so-called "Information Highway."

Brief Summary Text (16):

One problem with the Internet is that a local computer can directly access the resources of another computer, thus allowing a local computer to introduce a boot sector virus, for instance, on the system disk of a remote computer such that the remote computer will become infected the next time the remote computer is booted.

NFS and RFS do utilize security controls to set the discretionary (public access as set by user) and mandatory (secured access defined through system maintained security attributes for each object on the system) controls when making a local file system available to the network. A remote user with proper authorities, however, still has direct access to the remote system's storage, however, and so the opportunity exists to transport unwanted data and programs to the remote system. This problem has caused serious consequences in the past (e.g., in 1988 a WORM virus spread throughout the Internet and infected many computers). "Local area networks" (LANS) are another common way to interconnect computers. Many businesses now store most or all of their important data on a special shared personal computer called a "file server." User computers access the shared file server over a high-speed data network called a "local area network" (LAN) or a "wide area network" (WAN). Briefly, a "local area network" interconnects data equipment within a limited geographical area, allowing user computers to communicate with each other and to share central resources such as printers, data storage, and long distance data communications. LANs are typically interconnected with coaxial copper cable, unshielded twisted pair cable, or fiber optics. Using a LAN to inter-connect computers provides a more efficient and faster means for data transfer than traditional file transfer methods. All users on a LAN can share resources such as printers, storage devices, and telecommunication links to limit costs associated with duplication of data and equipment. A LAN can also improve business functions with interconnected workstations accessing electronic mail and various shared applications such as customer service inquiry.

Brief Summary Text (36):

Price list, "Tape Backup," 1 page

Brief Summary Text (40):

Advertisement, Network Innovation, "Server Based Backup," 1 page

Brief Summary Text (47):

Advertisement, Business Communications, Gazelle, "Backup While You Work," June 1992, p. 436

Brief Summary Text (67):

Unattended access/attachment to the host (e.g., at a scheduled time during off peak hours) performs routine tasks such as incremental backup/archiving.

Brief Summary Text (70):

On-line virtual output facilities such as production printing, facsimile, and electronic mail can be economically provided on a "pay as you go" basis.

Detailed Description Text (67):

FIG. 6B schematically shows the "signal customer processing" performed by system 100. In the preferred embodiment, system 100 sometimes needs to report completed results of "off-line" processing requests to a customer computer 50. In addition, system 100 occasionally has a need to automatically establish contact with a customer computer 50 (e.g., to perform a regularly scheduled backup or software update operation). Also, system 100 may have messages or information from other users (e.g., electronic mail) that it needs to deliver to a customer computer 50. Instead of waiting until the user of customer computer 50 decides to initiate an on-line session with system 100, in the preferred embodiment system 100 is able to initiate a contact with a customer computer it needs to contact. In the preferred embodiment, system 100 initiates such a communication by "signalling" the specified customer computer 50. This signalling can be a request for the customer computer 50 to call system 100, or the signalling itself can provide the transfer of information that is needed (e.g., system 100 can "signal" a customer computer 50 with a "completion message" indicating that a particular processing task has been completed). As shown in FIG. 6B, such "signalling" can occur through a "signalling" connection between customer computer 50A and host computer 104, or it can occur via

a "signalling" connection between a customer computer 50B and a replica computer 160. In the preferred embodiment, such "signalling" connections are not true "on-line" connections because there is no ability for the user of customer computer 50 to interact with system 100. Rather, for security and other reasons, a true on-line connection (which may occur automatically in response to the signalling contact from the host) is established subsequently to the signaling connection and is initiated by the customer computer 50. Preferably requiring on-line connections to be initiated by customer computer 50 in the preferred embodiment increases security and also may make the customer feel better about security (since typically a great deal of very sensitive data may be stored on the customer computer).

Detailed Description Text (93):

Block 400 shows the On-line Service Customer Signup Process. Access is provided by dialing a special charge telephone number (block 400A). A message is displayed describing the services and charges for signup, and the amount of time left to exit before a signup charge is issued (block 400B). If the customer stays connected and responds to signup information, a user ID/password is assigned, software and control information is downloaded to the customer computer 50, and customer control information is stored on the host system 100 (block 400C). This control process can be performed by the on-line service computer 104 or the replica server computer 160. The latter is preferable because the link to the signup computer can be performed with standard communications software.

Detailed Description Text (101):

If the request is for "backup, restore and archive" services, host computer 104 logs certain information (e.g., user, begin time, etc.) for billing and security purposes (block 414), and then allocates ("mounts") the appropriate virtual disks containing the software needed to satisfy the request (block 416). The process of copying the information is performed in the preferred embodiment by customer computer 50 and/or replica computer 160 by copying information to and/or from a virtual disk (block 418). The end time is preferably then logged by host computer 104 for billing purposes (block 414).

Detailed Description Text (126):

Response defaults include: Immediate dialback, set interval time, display message. Other host reasons and response defaults can be created.

Detailed Description Text (146):

Backup Parameters 626

Detailed Description Text (147):

Backup Option Flag, Incremental Flag, Full Backup, Backup File List The backup option flag is used to indicate a backup request. Backup can be incremental, full backup or based on a file list. File list includes target location information.

Detailed Description Text (148):

Restore Parameters 628

Detailed Description Text (149):

Restore Option Flag, Incremental Flag, Full Restore, Restore File List Same as backup list above except files are restored from the on-line service. Data may be on Virtual Device or Archived to tape or other media.

Detailed Description Text (196):

If on-line service system 100 sends an access code ("yes" exit to decision block 570), communications interrupt handler 554 tests whether the received access code is valid (decision block 574). If the received access code is invalid, communications interrupt handler 554 logs an error and resets the pattern store (block 575). On the other hand, if the received access code is valid ("yes" exit to decision block 574), the communications interrupt handler performs a response based

on the particular access code (block 576). For example, one access code may require customer computer 50 to immediately initiate a call back to on-line service system 100. Another access code (a range of access codes) may simply require the customer computer 50 to display information (e.g., a completion message or mail waiting message) to alert the customer that he should initiate manually a call to on-line service system 100 in order to retrieve processing results, electronic mail, etc. This "access code" feature provided by the present invention is thus very useful in allowing limited communications to occur between on-line service system 100 and customer computer 50 with very little overhead and yet with a relatively high degree of safety.

Detailed Description Text (223):

FIG. 17 is a flowchart of exemplary program control steps performed by the host computer 104 when it is first "booted" or turned on. Beginning at block 902 ("boot"), the host computer starts its virtual device support software (block 904) and then begins a host security program 906 shown in FIG. 18. After the host security program 906 has been started, host computer 104 establishes a link and starts the subsystems for customer and replica on-line service sessions (block 908). Host computer 104 then displays a sign-on screen for either on-line or off-line replica operations as appropriate. Host computer 104 then begins a signal customer task (910) shown in FIGS. 19A-19B. This task signals customers and provides access codes to display messages or to trigger an on-line session at customer computer 50. Host computer 104 then begins a host request task 912 shown in FIGS. 20A-20B. This host request task manages host based requests on behalf of customers, which may be signaled or responded to by generating requests to replica computer 160. Once all of these tasks are in place, host computer 104 enters a loop (block 914, 915) where it is constantly checking and waiting for connects from customer computers 50 and off-line replica computer 160 in order to begin on-line sessions and/or off-line replica computer 160 sessions. When a call comes in, host computer 104 begins an on-line customer session (block 916 shown in more detail in FIGS. 21A-21E). Host computer 104 is multi-tasking so that many different on-line customer sessions may be progressing simultaneously. Similarly, when the off-line replica computer 160 makes a request (block 915), the host computer 104 begins an off-line replica session (block 917).

Detailed Description Text (257):

This table stores the completion messages issued by process requests. Notify status indicates if the message has been received and notify method indicates how the customer was notified (i.e., message sent to display during on-line session or signal request and access code sent to customer computer).

Detailed Description Text (259):

Error Message Table Occurs, Error Message, Status, Action Performed, Response This table stores the error messages received by the customer or on behalf of the customer (including off-line requests performed by Replica Process or Host Request Process). Status indicates the disposition of the message. Action performed indicates any response issued to the message. Response indicates the result of any actions performed.

Detailed Description Text (286):

Identifies the task to be performed. New tasks can be added to the table as they become available. Tasks include "backup," "restore," "archive," etc. as shown in FIG. 22C.

Detailed Description Text (309):

Identifies the task to be performed. New tasks can be added to the table as they become available. Tasks currently include backup, restore, archive, etc.

Detailed Description Text (323):

Host computer 104 next queries its communications controller 112 to determine

whether the customer computer is calling in on a special charge telephone number (e.g., a 900 number) (decision block 1126). If it is, host computer 104 displays a message specifying the service charges and prompts for acceptance within a specified time (block 1128). This gives the customer the opportunity to exit before phone charges begin. Basic charge amounts are also displayed. If the customer does not accept within a specified time (decision block 1130), host computer logs sign-off information for billing and security (block 1132), signs off the customer computer 50 (block 1134), and disconnects (block 1136). If the customer does accept, then host computer 104 sets a Telco billing access flag 1002W within the customer control data block 1002 to indicate that billing is being handled by the telephone company instead of by the host computer 104 (block 1138).

CLAIMS:

3. A method of providing on-line computer backup services simultaneously to multiple remote online backup service customers by attaching at least one virtual backup storage resource to customers' computers using at least one Internet telecommunications link connecting the customers' computers with a geographically remotely located backup service provider, the method comprising:

- (a) providing storage for backup use through an online backup service provider;
- (b) establishing an Internet connection between the online backup service provider and a geographically remotely located customer's computer;
- (c) attaching, over the Internet connection, at least a part of the online backup service provider's storage to the customer's computer as a virtual backup storage device;
- (d) allowing the customer's computer to access the virtual backup storage device substantially as if the virtual backup storage device was a physical backup storage device locally attached to the customer's computer;
- (e) permitting the customer's computer to write information to the virtual backup storage device, including the step of transmitting written information to the online backup service provider over the Internet connection and storing the written information on the online backup service provider's storage;
- (f) requesting payment from said customer; and
- (g) denying said customer further access rights to said virtual backup storage device if said requested payment is not received.

30. A method as in claim 3 further including the step of automatically periodically backing up customer computer data onto the online backup service provider's storage.

31. A method as in claim 3 wherein the customer computer includes a file system, and step (e) includes the step of allowing the customer computer to access the remote storage provided by the online backup service provider by integrating at least a portion of the Internet connection for access by the customer computer's file system.

32. A method as in claim 3 further including the step of providing an online signup system allowing a customer to subscribe to the online backup service.

34. A method as in claim 3 wherein step (d) includes establishing at least a portion of the Internet connection as a backup destination for the customer computer.

36. A method as in claim 3 wherein step (e) includes the step of encrypting the back up data before transmitting it to the online backup service provider over the Internet connection.

37. A method as in claim 3 wherein step (e) includes the step of compressing the back up data before transmitting it to the online backup service provider over the Internet connection.

40. A method as in claim 3 further including the steps of:

repeating steps (b) - (d); and

allowing the customer to restore data from the online backup service provider storage over the Internet connection.

41. A method as in claim 40 wherein the step of allowing the customer to restore data includes the step of allowing the customer computer to request backup data by file name.

42. A method as in claim 3 further including the step of checking the backup data for computer viruses.

45. A method as in claim 3 wherein step (f) includes the step of charging the customer a fee based at least in part on the amount of storage used by the customer computer to store backup data.

46. A method as in claim 3 further including the step of allowing the customer to specify information used for accessing the online backup service provider.

47. A method as in claim 3 wherein step (e) includes the step of performing an incremental backup.

48. A method as in claim 3 wherein step (e) includes the step of performing a full backup.

49. A method as in claim 3 wherein step (e) includes the step of selecting file names for backup.

50. A method as in claim 3 wherein at least one of step (d) and step (e) includes the step of conditionally sending a message from the online backup service provider to the customer computer indicating that access is not allowed.

52. A method as in claim 3 wherein step (d) is performed at least in part under control of software executing on the customer computer, and the method further includes the step of downloading the software from the online backup service provider to the customer computer over an online connection.

72. A method as in claim 1 wherein step (f) includes the step of performing an incremental backup.

73. A method as in claim 1 wherein step (f) includes the step of performing a full backup.

74. A method as in claim 1 wherein step (f) includes the step of selecting files for backup.

79. A method as in claim 1 further including the step of executing backup management software in the customer's computer that establishes at least one file as selected for backup.

89. A method as in claim 3 further including the step of executing a multi-user backup device manager at the online service provider.

104. A method as in claim 3 further including the step of setting at least one service option that controls at least in part the way an online service request sent from the customer's computer to the online backup service provider is to be satisfied.

110. A method as in claim 3 further including the step of allowing the customer's computer to register with the online service provider for online backup services.

113. A method as in claim 3 further including the step of allowing the customer's computer to establish a subsequent connection and allowing the customer's computer to access the online backup service storage over said subsequent connection and restore the information written in step (e).

114. A method as in claim 3 further including the step of executing backup management software in the customer's computer that establishes at least one file as selected for backup.

156. A method as in claim 53 wherein step (g) includes the step of performing an incremental backup.

157. A method as in claim 53 wherein step (g) includes the step of performing a full backup.

158. A method as in claim 53 wherein step (g) includes the step of selecting files for backup.

159. A method as in claim 53 further including the step of allowing the customer's computer to establish a subsequent connection and allowing the customer's computer to access the online auxiliary storage over said subsequent connection and restore the data stored in step (g).

162. A method as in claim 53 further including the step of executing backup management software at the customer's computer that establishes at least one file as selected for backup.

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